

The Ruth H. Hooker Research Library

and Technical Information Center

Making the Virtual Library a Reality: How the Naval Research Laboratory Is Laying the Foundation for Its Library Without Walls

by Laurie E. Stackpole



**An Invited Paper Presented at the Library of Congress on September 15, 1993
Federal Librarians in the 21st Century: Changing Roles in the Electronic Age Sponsored by the
Federal Library and Information Center Committee
Part III: Serving Users--Case Studies in Successful Information Delivery**

I. INTRODUCTION

The Ruth H. Hooker Research Library and Technical Information Center is at the forefront in implementing services and systems to help the staff of the Naval Research Laboratory (NRL) successfully adopt new technologies that support information access. Among its innovative services are a Microcomputer Software Support Center that assists both scientists and administrators in identifying, evaluating, selecting and implementing computer systems and applications; a campus-wide information system, the InfoNet, that provides end-users with access to a broad spectrum of local and remote information sources from their in-office desktop computers or terminals; and an optical imaging system, seamlessly linked to a pre-existing online catalog, for the storage, retrieval, online display, and printing of materials from the Library's collections. The Library is currently forging agreements with scientific societies and other publishers to test the feasibility of providing network access to journals in electronic formats. Recent articles in *Science*, *Internet World* and *Government Computer News* have cited NRL as an example of the "virtual library" in action.

A. The Naval Research Laboratory

The Ruth H. Hooker Research Library and Technical Information Center meets the information needs of Naval Research Laboratory's (NRL) research community, consisting of about 3,500 Federal staff and about 1,500 contractors. NRL occupies a 130-acre campus of 152 buildings located on the Potomac River in Southwest Washington, D.C. The research efforts of the Laboratory are concentrated in 17 broad areas: acoustics, advanced space sensing, artificial intelligence, astrophysics, biotechnology, chemistry, condensed matter science, information technology, materials research, optical sciences, plasma physics, radar and electronics, radiation technology, remote sensing, space science, space systems, and structural dynamics.

B. The Ruth H. Hooker Research Library and Technical Information Center

For over 60 years, the Library has served as a focal point for meeting the information needs of the Laboratory. It has consistently been in the forefront in applying new information technologies and helping scientists exploit them successfully. Long before online databases covering the scientific journal and report literature were available, during the 1940's, 50's and 60's, staff indexed and abstracted journals and reports and provided this information to the Laboratory on a weekly basis. In the late 60's, the Library exploited early automation capabilities, loading computer tapes in-house to provide researchers with customized bibliographies. It has been a heavy user of online services since they first appeared in the early 70's. The Library also moved quickly to automate its internal processes as the technology became available. Circulation, using a punched card batch system, was automated in the late 60's, and a fully integrated library system with an online catalog was available by the early 80's. Since 1983, end-users have been able to search the Library catalog remotely over the campus network, known as NICE-net. In 1988, the Library began to

make CD-ROM databases available for end-user searching in the Library¹.

II. THREE INITIATIVES THAT SET THE STAGE FOR THE ELECTRONIC AGE

A. Microcomputer Software Support Center

While the Library's predisposition to exploit technology to improve information access has played a major role in preparing it to move into the electronic age, another important force has been the Library's role in supporting Laboratory microcomputing. By identifying software as an appropriate material to collect, circulate and support, the Library has been largely successful in erasing the distinction that sometimes exists between print-based and electronic materials, a distinction that in the 21st century threatens to turn libraries into mere warehouses for books and journals.

In 1988, the Library, which had been largely print-based for over 60 years, began to circulate commercial microcomputer software to its user community. The expansion of library collection and circulation services to encompass software was proposed by an NRL researcher and endorsed by the Laboratory's Computer Policy Panel. While software lending was complemented by expanded information capabilities, such as the Computer Library CD-ROM, it became clear that what users really needed was to interact with experts who were personally conversant with microcomputers and could provide information and advice on software applications and implementation. In September 1989, with the full support of Laboratory management, the Library opened a fully equipped and staffed Microcomputer Software Support Center to provide users with a one-stop location within the Library where they could get information and advice on software selection and implementation; hands-on experience and one-on-one instruction in its use; and assistance in solving installation, compatibility, and virus problems². Among the Center's more popular services are an evaluation lab where users can try out a wide range of software and many types of hardware peripherals; regularly scheduled demonstrations and expos to showcase microcomputer products; and management of the Laboratory's microcomputer user group with responsibility for planning and arranging monthly meetings for over 300 members.

With the establishment of the software lending program and the Microcomputer Software Support Center, the Library positioned itself as an organization that is knowledgeable about automation and capable of serving as a Laboratory resource for information of all types, electronic as well as print-based. This shift in emphasis led to the inclusion of the Library among the groups tapped to plan for NRL's fiber optic network. From this planning effort came the idea for a Laboratory Information Utility or Campus-wide Information System, implemented in August 1992, and known as the InfoNet.

B. The InfoNet

The InfoNet was developed in response to a network plan endorsed by Laboratory management that called for the creation of an information utility to:

- Provide researchers with access to local computer systems;
- Act as a gateway to remote systems;
- Integrate these functions with library materials and services;
- Make all this information available to researchers at their computers or workstations.

The InfoNet was introduced in August 1992. It allows users to query local and remote information systems and enables them to request Library materials and services without leaving their offices. The InfoNet presents users with a single menu from which they can select a wide variety of information resources including: library-mounted CD-ROM databases; other Laboratory databases including the Library catalog; and resources located throughout the world through pre-programmed access to selected Internet hosts. The InfoNet has succeeded in demonstrating that end users in their offices, using any computing platform, can directly use a single menu-driven interface to access a wide spectrum of information resources^{3,4}.

In February 1993, the Library upgraded its online catalog, installing the Sirsi STILAS (Scientific and Technical Information Library Automation System) and providing access through the InfoNet. Specifications for this new system, the Library's third, were based on the results of a user needs analysis conducted in June 1990, which was also considered in designing and developing the InfoNet. The user needs analysis showed

that users wanted a library system that was searchable from their offices and laboratories and that would:

- Offer access to multiple databases, both bibliographic and informational;
- Provide subject and author access to journal articles as well as books;
- Provide access to the catalogs of other libraries and to external databases;
- Allow users to request materials as part of an online search;
- Store full text files, such as journal articles or handbooks, for retrieval.

The initial implementation of the InfoNet addressed the first three of these goals. The addition of STILAS achieved the fourth goal; it provided remote users with the ability to request library materials identified as part of a catalog search⁵.

The InfoNet is currently available to employees and contractors at the D.C. campus only. Early next fiscal year access will be extended to NRL facilities in Bay St. Louis, MS, Orlando, FL, and Monterey, CA. Dial-in access, to permit users to use the InfoNet from home or while on travel, will also be made available.

While the InfoNet can meet many needs of the NRL research community for convenient and reliable access to scientific and technical information, it currently handles only text files. This limitation precludes the InfoNet from providing information such as equations, graphs and charts, which are often stored as images. Expanding the InfoNet to handle images is a high-priority effort, as the Library is a major user of optical imaging technology.

C. Optical Disk System

Major portions of the NRL research collection are already stored electronically as images retrievable at work stations in the library. Over 60,000 reports, 3.3 million pages, are stored on 12- inch optical disks in an autochanger or "jukebox." These images are seamlessly linked with the reports online catalog, enabling a user to perform a search, and by use of a "hot key" to view the entire report online one page at a time. The user has the capability of paging backward and forward or jumping ahead to a particular page. Individual pages or the entire report can be printed at will^{6,7}.

The Library has been using optical technology since May 1989, when it took delivery of a custom designed prototype system, which has since been replaced with a system composed entirely of off-the- shelf components. Scanning of reports and other library materials where copyright is not an issue, such as journal articles and other publications by NRL staff, is accomplished in-house using a high- speed scanner. Its experience and success in using a technology that is rapidly emerging as method choice for storing large quantities of information and data, has established the library as a player in the management of electronic information at the Laboratory. Its advice and support is sought by other offices. For example, it is currently discussing with the Laboratory's Office of Management and Administration a cooperative effort to store laboratory notebooks and other archives on disk.

Currently, scientists must come to the Library to use these capabilities. Providing complete documents to researchers at their desktops will be a major focus for the Library during the next fiscal year.

III. THE FUTURE

To respond to the needs of remote users for all the information contained in a document, the Library plans to link the optical capability, described above, to the InfoNet. To test the usefulness of this capability, the Library is seeking to provide access to one or more journals that appeal to a broad segment of the NRL community. Once fully implemented it is expected that this capability will allow a researcher at his desktop to search for and retrieve citations to reports or articles, read the abstract and other text portions of the record, bring up a page image of the publication itself with the touch of a key, and manipulate the image, that is enlarge it, rotate it, read it online, or print it out selectively or in its entirety.

The Library has recently reached an agreement in principle with the American Physical Society to disseminate Physical Review Letters and Physical Review E in electronic format. The project is planned in three phases over a two-year period, with phase one making the two titles available within the library, phase two providing network access to the D.C. campus, and phase three disseminating information to NRL remote

sites over the Internet. As part of this project the Library has offered to compare page images with text page description files, such as Postscript, as alternate methods for the electronic dissemination of journals.

With many publishers issuing journals on CD-ROMS, which combine "dirty" ASCII for searching with page images for retrieval, the Library is currently discussing with other professional societies a joint project to design and test methods for distributing such information over networks.

IV. CONCLUSION

Whether you call it a virtual library, a digital library, an electronic library or a library without walls, the goal is to provide full information to the user whenever and wherever he wants it, at home or away, 24 hours a day. Nobody is there yet, but the work going on at many institutions, including federal libraries, is laying the ground work for the library of the future.

V. REFERENCES

1. Stackpole, Laurie E., "CD-ROM in a Federal Scientific-Technical Library," *CD ROM EndUser*, June 1990, pp. 60-62. ,
2. Stackpole, Laurie E., "Software As a Library Material in Special Libraries: A Survey and Case Study," *Library Trends* 40, Number 1, Summer 1991, pp. 160-93.
3. Atkinson, Roderick D., Laurie E. Stackpole and John Yokley, "Campus-wide Network Access to CD-ROM Databases," *Proceedings of the Thirteenth National Online Meeting*, New York, NY, May 5-7, 1992, Learned Information, Inc, Medford, NJ, pp. 379-385.
4. Atkinson, Roderick D. and Daniel C. Curtiss, "Ile InfoNet: Integrating Networked CD-ROM Databases and Internet Search Tools," *Proceedings of the Fourteenth Annual Online Meeting*, New York, NY, May 4-6, 1993, Learned Information, Inc, Medford, NJ, pp. 17-24.
5. Stackpole, Laurie E. and Carolyn D. Thomas, "Selection, Implementation and Use of UNIX-Based Library Systems in a Campus Networked Environment," *Proceedings of the Eighth Integrated Online Library Systems Meeting*, New York, NY, May 5-6, 1993, Learned Information, Inc, Medford, NJ, pp. 131-139.
6. Bradley, Murray L. and Doris R. Folen, "Retrieval of Optical Images Using Cuadra Star and Genesys in the Ruth H. Hooker Research Library and Technical Information Center," *Proceedings of the Fourteenth National Online Meeting*, New York, NY, May 4-6, 1993, Learned Information, Inc, Medford, NJ, pp. 43-49.
7. Krumenaker, Larry, "How to Build a Library Without Walls," *Internet World* 4, No. 5, June/July/August 1993, pp. 9-12.



| [Home](#) | [NRL](#) | [Suggest](#) | [Search](#) |

webmaster@library.nrl.navy.mil

Updated: 27-NOV-95

Maintained by: [Fred Rettenmaier](#)